UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,013	07/13/2006	Jost Eberach	06043	5997

23338 7590 01/05/2009

DENNISON, SCHULTZ & MACDONALD
1727 KING STREET
SUITE 105
ALEXANDRIA, VA 22314

EXAMINER	
PATEL, DEVANG R	
ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
01/05/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/577,013	EBERACH, JOST	
	Examiner	Art Unit	
	DEVANG PATEL	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/8/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 14-17** are rejected under 35 U.S.C. 103(a) as obvious over Wagenbach et al. (DE 4429684 A1, translation of record) in view of Deutsch et al. (US 3410983, of record).

a. **Regarding claim 14,** Wagenbach et al. (“**Wagenbach**”) discloses a method for welding electric conductors using ultrasound (abstract). Wagenbach discloses the steps of:

i. introducing the conductors into a compression chamber 10 [fig. 1] that is bounded by at least two boundary elements (12, 14, 16, 18);

ii. closing the compression chamber and welding the wires by applying ultrasound via a first element such as a sonotrode 20 [fig. 1; pgs. 9-10; pg. 14]. The conductors are acted upon by pressure via the first element or a second element, such as a counter electrode 22, and whereby a characteristic magnitude (height/width) of the compression chamber is measured [pg. 11];

iii. Wagenbach discloses a control unit 46 that monitors and adjusts allocated welding parameters, including welding pressure, that are continuously adapted for ensuring uniform weld quality [pgs. 5,16]. Wagenbach discloses opening the compression space 10 by opening the

tool (i.e. decompressing the chamber; pg. 18) and measuring the characteristic magnitude during or after the welding operation [pgs. 17-18].

b. Wagenbach fails to explicitly disclose applying ultrasound to the welded conductors. However, **Deutsch et al.** (drawn to a method of resistance welding and testing) discloses applying a series of first pulses of ultrasonic energy to the workpieces prior to welding and also applying a series of second ultrasonic pulses after welding [col. 3, lines 40-46]. Deutsch teaches that in this way, a quantitative determination of the variations in the level of the received ultrasonic energy is effective for determining the quality of the weld as well as the type of defect [col. 3, lines 58-67]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to apply ultrasound on the welded parts as taught by Deutsch in the method of Wagenbach because such ultrasonic treatment allows effective determination of the quality of the weld and the type of defect [col. 3, lines 58-67].

c. **As to claim 15,** Wagenbach discloses that the compression chamber 10 is bounded by at least three elements (12, 14, 16) and after the welding, at least one previously fixed element in relation to the welded conductor is opened (i.e. decompressed and unlatched; pg. 18).

d. **As to claims 16-17,** Wagenbach discloses that a geometric value such as height or width is selected as a characteristic magnitude [pg. 6], the width/height being the spacing between first and second elements [fig. 1].

2. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagenbach (DE 4429684) in view of Deutsch et al. (US 3410983) as applied to claim 14 above, and further in view of Steiner et al. (US 5941443, of record).

e. **As to claim 18,** Wagenbach or Deutsch does not disclose measuring the geometric value by a displacement pickup. However, **Steiner** et al. (drawn to compaction and ultrasonic welding of electric conductors) discloses measuring compaction area (height & width) by a travel pickup [col. 2, lines 25-40]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the travel pickup device of Steiner in the method of Wagenbach to measure the geometric variables in order to apply proper welding parameters such as welding energy, amplitude, time, etc. during welding of the conductors [col. 2, lines 40-45].

3. **Claims 19-22 and 25-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagenbach et al. (DE 4429684) in view of Deutsch et al. (US 3410983) and further in view of Eder et al. (US 6393924, of record).

f. **Regarding claim 19,** Wagenbach discloses a method for quality checking of welded electric conductors using ultrasound (abstract). Wagenbach discloses a compression chamber bounded at least by an ultrasound-applying first element such as a sonotrode (20) and a second element such as a counter electrode (22), whereby the conductors are acted upon by pressure via the second or first element, including the steps of:

iv. introducing the conductors into a compression chamber 10 [fig. 1];

v. compacting and welding the conductors with simultaneous cross section diminution of the compression chamber [pg. 12];

vi. opening the compression space (i.e. decompressing) by opening the tool [pg. 18], whereby the welded conductors would remain between two elements at some point in time.

vii. measurement of a characteristic magnitude of the compression chamber during or after welding [pgs. 11, 17];

viii. Wagenbach fails to explicitly disclose applying ultrasound with simultaneous action of pressure. As for the ultrasound, **Deutsch et al.** discloses applying a series of first pulses of ultrasonic energy to the workpieces prior to welding and also applying a series of second ultrasonic pulses after welding [col. 3, lines 40-46]. Deutsch teaches that in this way, a quantitative determination of the variations in the level of the received ultrasonic energy is effective for determining the quality of the weld as well as the type of defect [col. 3, lines 58-67]. Concerning the step of applying pressure, **Eder et al.** (drawn to non-destructive testing of welded electric conductor by ultrasonic welding) discloses applying a pressure to the structure of the weld and checking the "uncoiling" of the conductor made up of strands of wires welded to each other [col. 2, lines 33-42]. In view of collective disclosures of Deutsch and Eder, it would have been obvious to a person of ordinary skill in the art at the time of the invention to apply ultrasound and pressure on the welded conductors in

the method of Wagenbach because the ultrasonic treatment allows effective determination of the quality of the weld and the type of defect [Deutsch -col. 3, lines 58-67] and applying pressure leads to a certain indication as to the strength and electrical conductivity of the weld [Eder - col. 2, lines 20-30]. With respect to simultaneous application of pressure and ultrasound, there is only finite number of predictable ways of applying pressure and ultrasound (one after another or concurrently). The claim would have been obvious because a person or ordinary skill has good reason to pursue the known options of applying pressure and ultrasound within his or her technical grasp and if this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

g. **As to claim 20,** Wagenbach discloses subjecting the conductors to pressure via the second lateral element [fig. 1].

h. **As to claim 21,** Wagenbach discloses that the quality of the welding is evaluated as a function of the measured characteristic magnitude of the compression chamber [pg. 13].

i. **As to claim 22,** Wagenbach discloses measuring the height and/or width of the compression chamber 10 [pg. 11].

j. **As to claim 25,** Eder discloses that the testing force to be applied depends on the cross-sections, size, and material of the wires making the strands of electrical conductor. It would have been obvious to one of ordinary skill

in the art at the time of the invention to choose the instantly claimed pressure range through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

k. **As to claim 26,** Eder discloses that the pressure applied substantially destroys the weld (uncoiling of the wires) for a faulty weld (col. 2, lines 35-42).

l. **As to claims 27-28,** the combination of Wagenbach, Deutsch and Eder as set forth in claim 19 above makes it obvious to an artisan of ordinary skill to apply an ultrasound along with simultaneous pressure in a weld quality checking method for the reasons set forth in paragraph f above. Wagenbach discloses measuring the changes in spacing between the first and second elements by measuring the compression area enclosed by the lateral surfaces of those elements during or after the process [pg. 17]. It would have been obvious to a person of ordinary skill in the art to apply ultrasound again for selective recompression of the weld in the method of Wagenbach because such treatment is favorable for a highly compacted weld [Wagenbach - pg. 6].

4. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagenbach (DE 4429684) in view of Deutsch et al. (US 3410983) and Eder et al. (US 6393924) as applied to claim 22 above, and further in view of Steiner et al. (US 5941443, of record).

m. **As to claim 23,** none of the reference applied to claim 22 above discloses measuring the geometric value by a displacement pickup. However, **Steiner** et al. (drawn to compaction and ultrasonic welding of electric conductors) discloses measuring compaction area (height & width) by a travel pickup [col. 2, lines 25-40]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the travel pickup device of Steiner in the method of Wagenbach to measure the geometric variables in order to apply proper welding parameters such as welding energy, amplitude, time, etc. during welding of the conductors [col. 2, lines 40-45].

5. **Claim 24** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagenbach (DE 4429684) in view of Deutsch et al. (US 3410983) and Eder et al. (US 6393924) as applied to claim 19 above, and further in view of Peter (US 4746051, of record).

n. **As to claim 24,** none of the references applied to claim 22 above discloses the duration of applying ultrasound. Peter is drawn to ultrasonic welding control method and apparatus to produced completed welds of acceptable quality (abstract). The controlled energy and time settings are in reference to the applied ultrasonic energy through converter 26, which vibrates the ultrasonic tool 50 to weld parts 54 and 56 [figs. 1, 4; col. 5, lines 15-27]. By way of example, Peter discloses time duration of 0.2 seconds (200 ms) and further states that the magnitudes of the energy and time settings are determined from actual welding of the workpieces [conductors in this case] and then

selecting magnitudes that produces acceptable welds [col. 8, lines 50-65]. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the control method of Peter in the process of Wagenbach and accordingly, choose the instantly claimed ultrasound duration range of 10-250 ms through routine experimentation in order to produce welds of acceptable quality.

Response to Amendment and Arguments

Applicant's arguments filed 10/7/08 are made in light of new claims 14-28, and are moot in view of the modified ground(s) of rejection set forth above.

Applicant argues that Wagenbach does not disclose releasing the pressure of the compaction chamber, then applying further ultrasound. Applicant also argues that Deutsch does not disclose releasing pressure or measuring characteristic magnitude. In response to applicant's arguments against the Wagenbach and Deutsch references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references (in this case Wagenbach and Deutsch). Wagenbach discloses measuring characteristic magnitude (height/width) of the compression chamber 10 (pg. 11) and decompressing the chamber (by opening the chamber 10- pg. 18). Deutsch discloses applying ultrasound to welded parts for effective determination of the quality of the weld.

Applicant argues that Deutsch does not relate to ultrasound welding, but rather to resistance welding. In response to applicant's argument that Deutsch is nonanalogous

art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Deutsch is in field of applicant's endeavor- welding and it also pertains to solving the problem of testing weld quality. Moreover, ultrasonic welding and resistance welding of Deutsch are similar since Deutsch discloses that the resistance welder has ultrasonic transducers for welding and testing (col. 1, line 17). Deutsch also states that the invention also applies to testing of electric resistance, spot, seam, and other types of pressure welds (col. 1, line 30). Thus, it would have been obvious to one skilled in the art to implement the testing technique of Deutsch in the welding method of Wagenbach in order to determine the quality of the weld and the type of defect (col. 3, lines 60-67).

Applicant argues that Eder does not disclose applying pressure while the wires remain in the compression chamber, and also fails to teach simultaneous action of ultrasound and pressure. In response, Examiner contends that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references (Wagenbach, Deutsch, and Eder) as set forth above.

Applicant also argues that Peter relates to ultrasonic welding control utilizing a timer and power input, and such teaching is totally unrelated to that of the claimed invention. Examiner respectfully disagrees. Peter is analogous art since it relates to ultrasonic welding control (the primary reference of Wagenbach concerns ultrasonic

welding). The time and power input of Peter are in reference to ultrasonic energy applied via converter 26 and determining an acceptable quality of weld using energy-time relationship (col. 5, lines 15-27; fig. 4).

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 10/8/08 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Claims 14-28 are rejected.

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood from the texts. Only specific portions of the texts have been pointed out to emphasize certain aspects of the prior art, however, each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

Applicant is reminded to specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. 1.121; 37 C.F.R. Part 41.37; and MPEP 714.02.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVANG PATEL whose telephone number is (571)270-3636. The examiner can normally be reached on Monday thru Thursday, 8:00 am to 5:30 pm, EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devang Patel/
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793